



[7590-01-P]

NUCLEAR REGULATORY COMMISSION

[NRC-2016-0233]

Pressurized Water Reactor Control Rod Ejection and Boiling Water Reactor Control Rod Drop Accidents

AGENCY: Nuclear Regulatory Commission.

ACTION: Notice of reissuance of draft regulatory guide; request for comment.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is reissuing for public comment draft regulatory guide (DG), DG-1327, "Pressurized Water Reactor Control Rod Ejection and Boiling Water Reactor Control Rod Drop Accidents." This DG proposes new guidance for analyzing accidents such as a control rod ejection for pressurized water reactors and a control rod drop for boiling-water reactors. It defines fuel cladding failure thresholds for ductile failure, brittle failure, and pellet-clad mechanical interaction and provides radionuclide release fractions for use in assessing radiological consequences. It also describes analytical limits and guidance for demonstrating compliance with regulations governing reactivity limits.

DATES: Submit comments by [INSERT DATE 90 DAYS FROM THE DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]. Comments received after this date will be considered if it is practical to do so, but the NRC is able to ensure consideration only for comments received on or before this date. Although a time limit is given, comments and suggestions in connection with items for inclusion in guides currently being developed or improvements in all published guides are encouraged at any time.

ADDRESSES: You may submit comments by any of the following methods (unless this document describes a different method for submitting comments on a specific subject):

- **Federal Rulemaking Web Site:** Go to <https://www.regulations.gov/> and search for Docket ID **NRC-2016-0233**. Address questions about docket IDs in Regulations.gov to Jennifer Borges; telephone: 301-287-9127; e-mail: Jennifer.Borges@nrc.gov. For technical questions, contact the individuals listed in the **FOR FURTHER INFORMATION CONTACT** section of this document.

- **Mail comments to:** Office of Administration, Mail Stop: TWFN-7-A60M, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, ATTN: Program Management, Announcements and Editing Staff.

For additional direction on obtaining information and submitting comments, see “Obtaining Information and Submitting Comments” in the **SUPPLEMENTARY INFORMATION** section of this document.

FOR FURTHER INFORMATION CONTACT: Paul Clifford, Office of Nuclear Reactor Regulation, telephone: 301-415-4043, e-mail: Paul.Clifford@nrc.gov and Edward O'Donnell, Office of Nuclear Regulatory Research; telephone: 301-415-3317; e-mail: Edward.ODonnell@nrc.gov. Both are staff of the U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

SUPPLEMENTARY INFORMATION:

I. Obtaining Information and Submitting Comments

A. Obtaining Information

Please refer to Docket ID **NRC-2016-0233** when contacting the NRC about the availability of information regarding this action. You may obtain publicly-available information related to this action, by any of the following methods:

- **Federal Rulemaking Web Site:** Go to https://www.regulations.gov and search for Docket ID **NRC-2016-0233**.

- **NRC's Agencywide Documents Access and Management System**

(ADAMS): You may obtain publicly available documents online in the ADAMS Public Documents collection at <https://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "[Begin Web-based ADAMS Search](#)." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov. The DG is electronically available in ADAMS under Accession No. ML16124A200.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

B. Submitting Comments

Please include Docket ID **NRC-2016-0233** in your comment submission. The NRC cautions you not to include identifying or contact information that you do not want to be publicly disclosed in your comment submission. The NRC posts all comment submissions at <https://www.regulations.gov> as well as enters the comment submissions into ADAMS. The NRC does not routinely edit comment submissions to remove identifying or contact information.

If you are requesting or aggregating comments from other persons for submission to the NRC, then you should inform those persons not to include identifying or contact information that they do not want to be publicly disclosed in their comment submission. Your request should state that the NRC does not routinely edit comment submissions to remove such information before making the comment submissions available to the public or entering the comment submissions into ADAMS.

II. Additional Information

The NRC is reissuing for public comment a DG in the NRC's "Regulatory Guide" series. This series was developed to describe and make available to the public information regarding methods that are acceptable to the NRC staff for implementing specific parts of the NRC's regulations, techniques that the staff uses in evaluating specific issues or postulated events, and data that the staff needs in its review of applications for permits and licenses.

The DG, entitled "Pressurized Water Reactor Control Rod Ejection and Boiling Water Reactor Control Rod Drop Accidents," is a proposed new guide temporarily identified by its task number, DG-1327.

DG-1327 describes one acceptable method for demonstrating compliance with appendix A of part 50 of title 10 of the *Code of Federal Regulations* (10 CFR), General Design Criteria (GDC) 28, "Reactivity Limit," with respect to a control rod ejection (CRE) for pressurized-water reactors (PWRs) and a control rod drop (CRD) for boiling-water reactors (BWRs). DG-1327 proposes new guidance for analyzing these reactivity-initiated accidents. It defines fuel cladding failure thresholds for ductile failure, brittle failure, and pellet-clad mechanical interaction and provides radionuclide release reactions for use in assessing radiological consequences. It also describes analytical limits and guidance for demonstrating compliance with regulations governing reactivity limits.

The draft guide incorporates new empirical data from in-pile, prompt power pulse test programs and analyses from several international publications on fuel rod performance under reactivity-initiated accident conditions to provide guidance on acceptable analytical methods, assumptions, and limits for evaluating a CRE accident for a PWR. The draft guide expands the existing guidance for CRE accidents in

Regulatory Guide (RG) 1.77, "Assumptions Used for Evaluation a Control Rod Ejection Accident for Pressurized Water Reactors." However, the NRC intends to maintain RG 1.77.

The NRC released the draft guide for public comment on November 21, 2016 (81 FR 83288) with a 60 day comment period that expired on February 21, 2017. A public meeting was held at NRC Headquarters on January 25, 2017, while the guide was open for public comment. During the meeting, the NRC made a commitment to hold a second public meeting to discuss the staff's proposed resolution of key comments prior to finalization of the guide. Following the January 25, 2017 public meeting, the NRC extended the comment period to April 21, 2017 (February 1, 2017; 82 FR 8958) to allow more time for comment. A second public meeting was held at NRC Headquarters on June 5, 2018, to discuss resolution of the public comments. To facilitate discussion at the meeting, drafts of the guide (ADAMS Accession No. ML18138A459) and a table showing the NRC staff's initial resolution of the public comments (ADAMS Accession No. ML18138A458) were made publicly available prior to the meeting.

As a result of the written public comments and discussions at the public meetings, the NRC made several changes to the draft guide, and the NRC's final response to the public comments can be found in ADAMS under Accession No. ML18302A107. Among the changes were: (1) division of the analytical methods in the staff regulatory guidance to differentiate between PWRs and BWRs, (2) the graphs for cladding failure thresholds were extended based on more recent testing, (3) addition of an appendix to define acronyms and abbreviations used in the guide, (4) addition of an appendix that provides guidance on steady-state and transient gap fission product inventories for releases following a CRE or CRD accident, and (5) addition of an appendix that has alloy-specific cladding hydrogen uptake models.

III. Backfitting and Issue Finality

DG-1327 describes one acceptable method for demonstrating compliance with GDC 28 in 10 CFR part 50, appendix A, with respect to a control rod ejection for PWRs and a control rod drop for BWRs. It addresses fuel cladding failure thresholds for ductile failure, brittle failure, and pellet-clad mechanical interaction, provides radionuclide release fractions for use in assessing radiological consequences, and describes analytical limits and guidance for demonstrating compliance with GDC 28 governing reactivity limits.

This draft regulatory guide, if finalized, would not constitute backfitting as defined in 10 CFR 50.109, “Backfitting” (the Backfit Rule) and would not otherwise be inconsistent with the issue finality provisions in 10 CFR part 52, “Licenses, Certifications and Approvals for Nuclear Power Plants.” Existing licensees and applicants of final design certification rules will not be required to comply with the positions set forth in this draft regulatory guide. Further information on the staff’s use of the draft regulatory guide, if finalized, is contained in the draft regulatory guide under Section D., “Implementation.”

Applicants and potential applicants are not, with certain exceptions, protected by either the Backfit Rule or any issue finality provisions under 10 CFR part 52. Neither the Backfit Rule nor the issue finality provisions under 10 CFR part 52 – with certain exclusions discussed below – were intended to apply to every NRC action which substantially changes the expectations of current and future applicants. Therefore, the positions in any final draft regulatory guide, if imposed on applicants, would not represent backfitting (except as discussed below).

The exceptions to the general principle are applicable whenever a 10 CFR part 50 operating license applicant references a construction permit or a

combined license applicant references a 10 CFR part 52 license (i.e., an early site permit or a manufacturing license) or regulatory approval (i.e., a design certification rule or design approval). The staff does not, at this time, intend to impose the positions represented in the draft regulatory guide in a manner that is inconsistent with the Backfit Rule or any issue finality provisions in these 10 CFR part 52 licenses and regulatory approvals. If, in the future, the staff seeks to impose a position in this regulatory guide in a manner that constitutes backfitting under the Backfit Rule or does not provide issue finality as described in the applicable issue finality provision, then the staff will address the backfitting provisions in the Backfit Rule or criteria for avoiding issue finality as described in the applicable issue finality provision.

Dated at Rockville, Maryland, this 24th day of July, 2019.

For the Nuclear Regulatory Commission.

Thomas H. Boyce,
Chief,
Regulatory Guidance and Generic Issues
Branch,
Division of Engineering,
Office of Nuclear Regulatory Research.

[FR Doc. 2019-16067 Filed: 7/29/2019 8:45 am; Publication Date: 7/30/2019]